

IN THE CLAIMS:

The following is a complete listing of claims and replaces all prior versions and listings of claims in the present application:

Claim 1 (currently amended): A printing system for printing a print job comprising a number of pages, the system including:

a renderer software interface;

a receiving hardware interface for performing first coupling of incoming page description data, in the form of a display list, to ~~[[a]]~~ said renderer software interface~~[[;]]~~, said renderer software interface being for performing first processing of the display list, ~~[[to]]~~ thereby to output a first processed display list; and

rendering hardware, adapted to perform second processing of the first processed display list, ~~[[to]]~~ thereby to output raw pixel data,

wherein~~[[:]]~~ said receiving hardware interface, ~~the~~ said rendering software interface, and ~~the~~ said renderer hardware are arranged to operate in a pipelined manner, being thereby capable of concurrently processing job data from at least one page of the print job.

Claim 2 (currently amended): A printing system according to claim 1, further comprising:

a host application for outputting at least one call defining said print job;

a printer driver for performing third processing of the at least one call, ~~[[to]]~~ thereby to output page description data;

a host hardware interface for performing second coupling of ~~said the~~ page description data to ~~the~~ said receiving hardware interface;

an interpreter, interposed between ~~the~~ said receiving hardware interface and ~~the~~ said renderer software interface, wherein ~~the~~ said receiving hardware interface couples said page description data to ~~the~~ said interpreter, said interpreter receiving and processing the coupled page description data ~~[[to]]~~ thereby to output ~~said the~~ display list; and

a marking engine for generating an image on an output print medium for the print job dependent upon ~~said the~~ raw pixel data,

wherein~~[[:]]~~ said host application, ~~the~~ said printer driver, ~~the~~ said host hardware interface, ~~the~~ said interpreter and ~~the~~ said marking engine are arranged to operate in a pipelined manner, being thereby capable of concurrently processing job data from at least one page of the print job.

Claim 3 (currently amended): A printing system according to claim 2, wherein ~~said the~~ one call comprises a GDI call in a Windows™ operating system.

Claim 4 (currently amended): A printing system according to claim 2, ~~wherein~~ further comprising a spooler and a port monitor ~~are~~ interposed between ~~the~~ said printer driver and ~~the~~ said host hardware interface, and a colour converter and an output processor interposed between said rendering hardware and said marking engine, and

wherein[[:]] said spooler couples the page description data output from ~~the~~ said printer driver to ~~the~~ said port monitor; ~~and,~~

~~the~~ said port monitor couples the page description data output from ~~the~~ said spooler to ~~the~~ said host hardware interface, ~~and wherein a colour converter and an output processor are interposed between the rendering hardware and the marking engine, wherein:~~

~~the~~ said colour converter converts the raw pixel data being represented in a first colour space to converted raw pixel data being represented in a second colour space, ~~said~~ the converted raw pixel data being provided to ~~the~~ said marking engine instead of the raw pixel data, ~~wherein and~~

said spooler, ~~the~~ said port monitor, and ~~the~~ said colour converter are arranged to operate in a pipelined manner, being thereby capable of concurrently processing job data from at least one page of the print job.

Claim 5 (currently amended): A printing system according to claim 4, wherein at least one of ~~the~~ said spooler and ~~the~~ said port monitor is implemented in software.

Claim 6 (original): A printing system according to claim 1, wherein said rendering hardware has a display list memory for storing the first processed display list.

Claim 7 (currently amended): A method of data processing for a printing system adapted for printing a print job comprising a number of pages, said method comprising steps of:

first coupling, by a receiving hardware interface, of incoming page description data to a renderer software interface in the form of a display list;

performing first processing, by the renderer software interface, of the display list, ~~[[to]]~~ thereby to output a first processed display list; and

performing second processing, by rendering hardware, of the first processed display list, ~~[[to]]~~ thereby to output raw pixel data,

wherein~~[[:]]~~ said first coupling, said first and said second processing steps ~~operate~~ are performed in a pipelined manner, being thereby capable of concurrently processing job data from at least one page of the print job.

Claim 8 (currently amended): A method according to claim 7, comprising further steps of:

outputting, by a host application, at least one call defining ~~said~~ the print job;

performing third processing, by a printer driver, of the at least one call, ~~[[to]]~~ thereby to output page description data;

second coupling, by a host hardware interface, ~~said~~ the page description data to the receiving hardware interface;

interpreting, by an interpreter, the incoming page description data coupled from the receiving hardware interface, ~~[[to]]~~ thereby to output ~~said~~ the display list; and

generating, by a marking engine, an image on an output print medium for the print job dependent upon ~~said~~ the raw pixel data,

wherein[[:]] said outputting, third processing, second coupling, interpreting and generating steps operate are performed in a pipelined manner, being thereby capable of concurrently processing job data from at least one page of the print job.

Claim 9 (currently amended): A method according to claim 8, wherein ~~said~~ the one call comprises a GDI call in a Windows™ operating system.

Claim 10 (currently amended): A method according to claim 8, comprising further steps of:

third coupling, by a spooler, the page description data output from the printer driver to a port monitor;

fourth coupling, by the port monitor, the page description data output from the spooler to the host hardware interface;

storing, by a display list memory, the first processed display list for outputting to the rendering hardware;

converting, by a colour converter, the raw pixel data being represented in a first colour space to converted raw pixel data being represented in a second colour space, ~~said~~ the converted raw pixel data being provided to the marking engine instead of the raw pixel data,

wherein said third and fourth coupling steps, ~~the~~ said storing and ~~the~~ said converting steps operate are performed in a pipelined manner, being thereby capable of concurrently processing job data from at least one page of the print job.

Claim 11 (original): A method according to claim 10, wherein at least one of the spooler and the port monitor is implemented in software.

Claim 12 (currently amended): A computer readable medium for storing a program for a print system adapted to print a job comprising a number of pages, said program comprising:

code for a first coupling step for of coupling, by a receiving hardware interface, of incoming page description data to a renderer software interface in the form of a display list;

code for a first processing step for of processing, by the renderer software interface, of the display list, to thereby to output a first processed display list; and

code for a second processing step for of processing, by rendering hardware, of the first processed display list, to thereby to output raw pixel data,

wherein^[:] said code for the first coupling step^[,] and said code for the first and said second processing steps operate in a pipelined manner, being thereby capable of concurrently processing job data from at least one page of the print job.

Claim 13 (currently amended): A computer program for a print system adapted to print a job comprising a number of pages, said program comprising:

code for a first coupling step for of coupling, by a receiving hardware interface, of incoming page description data to a renderer software interface in the form of a display list;

code for a first processing step ~~[[for]]~~ of processing, by the renderer software interface, of the display list, ~~[[to]]~~ thereby to output a first processed display list; and

code for a second processing step ~~[[for]]~~ of processing, by rendering hardware, of the first processed display list, ~~[[to]]~~ thereby to output raw pixel data,

wherein~~[[:]]~~ said code for the first coupling step~~[[,]]~~ and said code for the first and said second processing steps operate in a pipelined manner, being thereby capable of concurrently processing job data from at least one page of the print job.

Claim 14 (currently amended): A method of data processing for a printing system according to Claim 1, which comprises a sequence of pipeline processes, said method comprising, for a current pipeline process being said renderer software interface, steps of:

reading input data from an upstream pipeline process being ~~said~~ the receiving hardware interface;

operating upon ~~said~~ the input data if an internal buffer of ~~said~~ the current pipeline process is not full;

stalling ~~said~~ the upstream pipeline process, if ~~said~~ the internal buffer is full; and

writing ~~said~~ the input data, having operated thereupon, to a downstream pipeline process being ~~said~~ the rendering hardware, if ~~said~~ the downstream pipeline process is not stalling ~~said~~ the current pipeline process.

Claim 15 (currently amended): method according to claim 14, wherein said operating step comprises at least one of:

processing ~~said~~ the input data; and

storing ~~said~~ the input data.

Claim 16 (currently amended): A method according to claim 14, wherein ~~said~~ the sequence of pipeline processes comprises at least one hardware process and one software process.

Claim 17 (currently amended): A method according to claim 14, wherein said operating step associated with each process in ~~said~~ the sequence of pipeline processes is performed substantially concurrently, by all processes in ~~said~~ the sequence.